



SREB

MAKING
MIDDLE GRADES
WORK

October 2005

Southern
Regional
Education
Board

592 10th St. N.W.
Atlanta, GA 30318
(404) 875-9211
www.sreb.org

Best Practices for Implementing HSTW and MMGW

High-quality Career/Technical Programs Give Students a Boost Toward a Good Job and Postsecondary Studies

Schools that provide access to high-quality, high-demand career/technical studies can raise students' academic and technical achievement, increase high school completion rates and prepare students for postsecondary studies and good jobs. Middle schools as well as high schools have a role to play in equipping students for productive careers.

Middle schools can lay the foundation by getting students to participate in exploratory studies to identify the career fields they like best. High schools can improve the quality of career/technical studies by aligning the curriculum and assessments to academic and industry standards; supporting career/technical teachers with mathematics, reading and science content knowledge; offering quality work-based learning; and involving students in career concentrations through small learning communities, career academies, career/technical centers and early postsecondary experiences.

Exploring careers in the middle grades

Exploratory courses, particularly those that focus on mathematics and science, help middle grades students learn about a variety of career fields. The ACT Explore® program is designed to help eighth-graders investigate a broad range of options for the future. This early-planning tool can provide baseline information on students' academic knowledge and skills and can assess career interests as students develop long-range plans for high school and beyond. (Contact Judy Trice at ACT Regional Professional Development in Austin, Texas, at judy.trice@act.org.)

A number of middle schools have been successful in using programs that incorporate academic skills into career planning and exploration. For example:

This newsletter of "best practices" in implementing *High Schools That Work* and *Making Middle Grades Work* is based on presentations related to Conference Objective 3 (Providing High-quality Career/Technical Education) from the 19th annual *HSTW* Staff Development Conference. The conference was held July 13-16, 2005, at the Gaylord Opryland Resort and Conference Center in Nashville, Tennessee. For more information on Conference Objectives and Sub-objectives, go to www.sreb.org.

- Teachers in the **Henry County** school system in McDonough, Georgia, wrote and implemented a modular program that incorporates technology with student-directed learning to emphasize mathematics, science, language arts, reading and life skills. The program has received wide recognition and was featured on CNN television. (*Contact Lynn Pack at lynnpack@bellsouth.net.*)
- Vital Link is a program for all eighth-graders in the **Fayetteville (Arkansas) School District**. This program gives a “behind the scenes” look at the world of work and prepares students for apprenticeship opportunities in grades 11 and 12. Some 350 eighth-graders visit work sites where they see that success in the classroom leads to success in the workplace. The local chamber of commerce is a partner in the program. One student impressed his “employer” so much that the business owner asked him to serve as an apprentice. He worked at the store throughout high school and college, received an engineering degree from the University of Arkansas, and has returned to the business as a full-time employee. (*Contact Phyllis McGinty, youth apprenticeship director, at pmcginty@fayar.net.*)
- The Gateway to Technology middle grades curriculum focuses on developing stronger mathematics, science and technology skills. It shows — rather than tells — students how professionals in the engineering field use technology to solve everyday problems. (*Contact Kenneth Mason, Project Lead The Way, at kenneth.mason@sreb.org.*)

Aligning curriculums and assessments to academic and industry standards

High-quality career/technical programs begin with curriculums and assessments that are aligned to academic and industry standards. A course syllabus describing what students are expected to learn, what major projects and assignments they will complete, and how they will be assessed will help teachers plan standards-based courses and communicate performance expectations to students and parents. Schools can create a course syllabus template for all teachers to follow, establish criteria for what is included, and provide time for teachers to work together on course syllabi and share examples of well-written syllabus components. (*For more information on preparing syllabi, look at Designing Challenging Vocational Courses — A Guide to Preparing a Syllabus by Gene Bottoms, David J. Pucel and Ione Phillips, 97V46, 1997, \$10.*)

Academic and career/technical teachers can assess whether the syllabus is aligned to academic and industry standards by collaboratively and continually looking at student work on assignments and assessments, analyzing the quality of that work, and deciding on steps to take in getting more students to reach the Proficient level.

Using a process such as a “tuning protocol” to examine student work provides a structure for teachers to bring student work to their colleagues for feedback. The components of the tuning protocol process are: 1) a teacher’s presentation of an assignment, 2) clarifying questions by his or her colleagues, 3) warm and cool feedback and 4) the presenter’s response to the feedback. A facilitator sets the tone for a tuning session by asking the question, “What can we do to get more students to score at the Proficient level on this assignment or assessment?”

Caddo Career and Technology Center in Shreveport, Louisiana, is aligning all of its career/technical programs to industry standards. “The value of industry-based certification is that it provides validity to the curriculum,” Principal **Gayle Flowers** said. “It leads to better assessments and ultimately to better instruction.”

Depending on the criteria for certification required by each industry, Caddo seeks accreditation for its career/technical programs and prepares students to take industry certification exams. The center’s automotive program was the first in the state to earn Automotive Youth Education Systems (AYES) accreditation and was the only one in the nation to receive a perfect accreditation score. All students are expected to take industry certification exams if such exams are available in their career/technical areas. In the 2004-2005 school year, a total of 402 industry certifications were earned out of 800 students enrolled at the center. Some students earn more than one certification. A local foundation pays half the cost of taking a certification exam; students and their parents pay the other half.

Teachers at Caddo use industry standards to develop course syllabi that are reviewed annually by employers. Each career/technical teacher completes a workplace visit. As a result of this focus on excellence, Caddo can point to strong support from the business community, greater involvement in student organizations, and more students taking and earning postsecondary credit. (*Contact Gayle Flowers at gflowers@caddo.k12.la.us.*)

Strengthening the academic knowledge and skills of career/technical teachers

Research has shown that students' mathematics achievement increases when career/technical teachers enrich the curriculum with mathematics concepts. To achieve this kind of enrichment and to improve student achievement, career/technical teachers need professional development showing how to combine academic knowledge and skills from mathematics, science and communications with the occupational content of career/technical programs.

The **National Research Center for Career and Technical Education** identified five principles of effective staff development in improving the mathematics content of career/technical education and raising student achievement. The same principles are likely to hold true for science and communication.

- **Create and sustain a “community of professional practice.”** School districts can assist schools in organizing eight to 10 teams of career/technical and academic teachers representing various career/technical areas such as marketing or auto technology. The teams need to work together over a period of time to create academically enhanced strategies for career/technical classrooms.
- **Fit the academic content to the career/technical curriculum rather than the other way around.** True contextual learning occurs when the academic content emerges from an authentic assignment. Forcing a mathematics curriculum, such as Algebra I, into a career/technical curriculum will be less effective because it quickly will resemble a traditional mathematics course.
- **Build an appreciation for mathematics as a workplace skill.** It should be just as appropriate for students in an auto technology course to reach for a mathematics formula as it is to reach for a wrench.
- **Maximize the amount of mathematics in the career/technical curriculum.** Academic knowledge does not follow a sequence when it comes from work-related projects. Authentic projects with rich mathematics requirements should be developed whenever possible.

- **Career/technical teachers are “teachers of mathematics in career/technical education.”**

They are not mathematics teachers. Make sure they have professional development to build their skills in teaching the mathematics content in their career/technical courses.

Schools can promote academic knowledge and skills in career/technical education by conducting summer workshops for career/technical teachers and academic teachers. Working in teams, the teachers can identify the location of academic content in career/technical courses and develop instructional strategies to use in the coming year. Professional development and support activities during the school year will give teachers opportunities to refine and improve the strategies.

(Contact **James Stone III**, National Research Center for Career and Technical Education, University of Minnesota, at stone003@umn.edu.)

Science teachers and career/technical teachers at **Charles H. McCann Technical School** in North Adams, Massachusetts, work together to ensure that all students complete four years of college-preparatory science. Teachers use engaging, career-focused science projects to involve students in the science curriculum and to develop high-level cognitive skills. The annual projects gradually prepare students to complete the rigorous project required for senior year. The success of this added emphasis on science is evident in the fact that failure rates in science have declined from as high as 30 percent to below 10 percent. Students who participated in the 2004 *HSTW* Assessment exceeded the performance goal in science and scored higher than the average for students at all *HSTW* sites.

The Class of 2009 will need to pass a statewide science assessment to graduate from high school. “We are not worried about our students meeting this requirement, because ever since we joined the *HSTW* network we have been working hard to get them ready for science in college and a career,” Assistant Principal **Barbara Malkas** said. “This year we are offering the first course of Project Lead The Way as an elective in addition to our science requirement.” (Contact **Barbara Malkas** at bmalkas@mccanntech.org.)

The schoolwide literacy campaign at **EHOVE Career Center** in Milan, Ohio, focuses career/technical and academic teachers on helping students read and write across the curriculum. Career/technical teachers receive professional development on various levels of writing and learn to make assignments that are appropriate for each level. The levels are: capturing ideas, responding correctly, editing, peer editing and publishing. The assignments might include writing a journal at the level of “capturing ideas” and completing a research report at the “publishing” level. Teachers document writing practices in their lesson plans and display writing posters in their classrooms. The campaign also includes a summer reading program, sustained silent reading in classrooms and incentives for students who read for pleasure. A reading-across-the-curriculum consultant, who visits the center twice a year, reviews teachers’ logs on the number and types of writing assignments given and meets individually with teachers to discuss progress. (*Contact Assistant Director Mark Ringlein at mringlein@ehove-jvs.k12.oh.us.*)

Building students’ relationships with experts from their chosen career fields

The relationships developed in a work-based learning experience will help a student develop a greater understanding of his or her chosen career field. This type of learning experience expands greatly on what is learned in the classroom in the areas of technology, methodology, terminology and techniques. A good work-based learning experience can help a student clarify his or her decisions about a career and a postsecondary program of study. A rigorous and well-planned apprenticeship program or internship program can revitalize the senior year and help students prepare for higher education and the workplace. Job shadowing experiences can assist students in selecting a career concentration and related course work for high school.

A successful work-based learning program should be designed carefully to provide a number of learning-rich activities and opportunities, such as:

- paid and unpaid experiences to accommodate more students with a multitude of career interests;
- regularly scheduled seminar classes with challenging assignments that give students opportunities to share and reflect on their experiences;

- a formal presentation and a final research paper to emphasize the importance of strong academic knowledge and good communication skills in the workplace;
- an adult mentor at the business or industry to teach job requirements and procedures;
- rotation through different areas of the workplace;
- a learning plan listing workplace responsibilities;
- a program coordinator to monitor students’ progress, visit the worksite and conduct performance reviews; and
- end-of-program “credentials” to help students showcase their skills and experiences for future employment opportunities and acceptance into postsecondary programs.

The youth apprenticeship program at **Fayetteville High School** in Fayetteville, Arkansas, was created to broaden educational, career and economic opportunities for students through partnerships involving businesses, schools and community-based organizations. A total of 353 students in grades 11 and 12 were enrolled in the program in the 2004-2005 school year. The program integrates academic and career/technical learning and meets state standards. Students completing the program have the satisfaction of graduating from high school with a skills certificate from the state department of labor, career training and practical work experience. They receive elective school credit for their participation. Arkansas businesses employing students as youth apprentices are eligible for state tax credit. (*Contact Superintendent Bobby New at bnew@fayar.net.*)

Gooding High School, located in rural Gooding, Idaho, used limited resources to create a variety of work-based, cross-curricular opportunities such as career academies and senior projects. The academies are small learning communities for students in grades 10 through 12. The four academies are: Information and Technology, Career Arts, Cabinetry/Millwork and Health. The purpose of an academy is to combine academic rigor with students’ career interests. Students take four English courses, three mathematics courses and three science courses. Dual credit/tech prep college credit is available. The senior year is utilized to the fullest: Students take English, mathematics, science, economics and academy or career courses. They also complete a senior project that combines academic and career/technical knowledge and skills. (*Contact Bridgit Arkoosh, English/language arts teacher, at arkooshb@gooding.k12.id.us.*)

Giving students access to high-quality career/technical studies

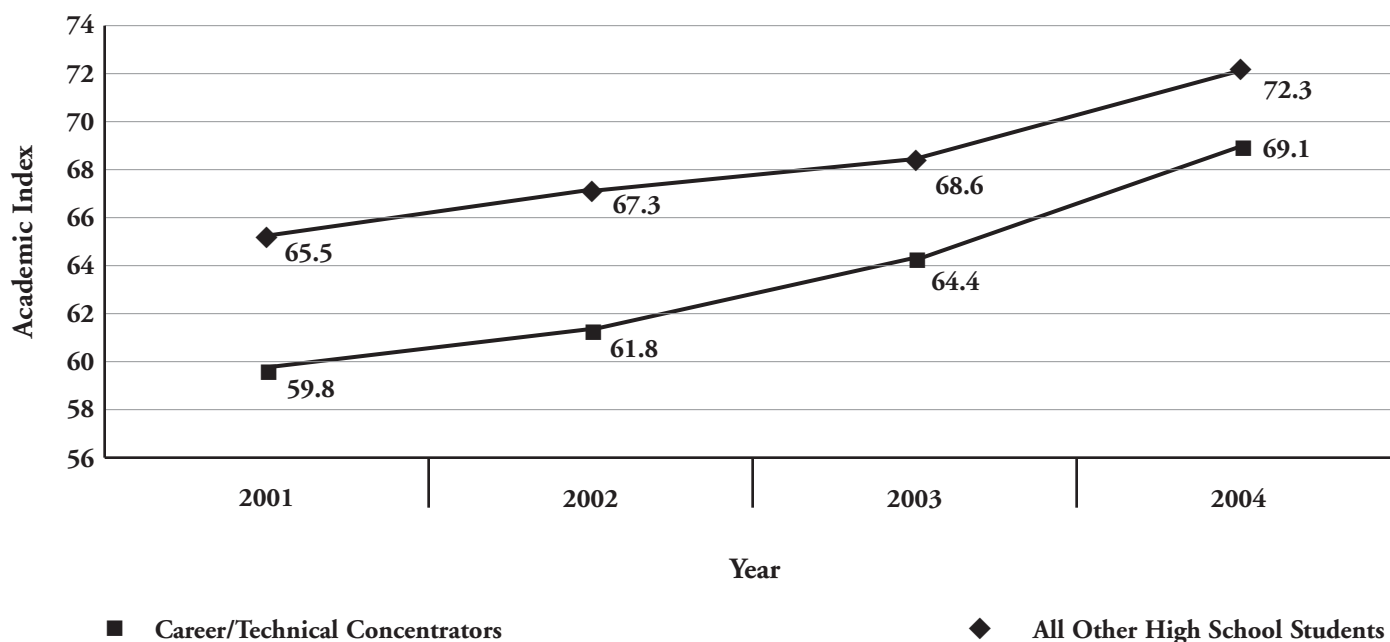
Schools can give more students access to high-quality career/technical studies through a variety of strategies: designing concentrations for high school programs of study, organizing into small learning communities or career academies, and increasing access to postsecondary institutions through dual-enrollment and Web-based courses.

Several states have adopted policies to help schools add focus and purpose to students' high school experiences. Leaders from **Maryland, Kentucky and South Carolina** point to success in closing gaps in achievement by requiring all students to complete a rigorous academic core of courses and to designate a career or academic concentration. (Contact Rodney Kelly, Kentucky Department of Education, at rodney.kelly@education.ky.gov; Kathy Oliver, Maryland Department of Education, at Koliver@MSDE.State.MD.US; or Bob Couch, South Carolina Department of Education, at jcouch@sde.state.sc.us.)

States and schools that want to narrow the gap between career/technical students and all students can raise the quality of high school career/technical studies and integrate academic content into those courses. The Division of Career and Technical Education in Kentucky found that career/technical concentrators are making a faster rate of gain in academic achievement as the gap closes between those students and all other students. (See Figure 1.)

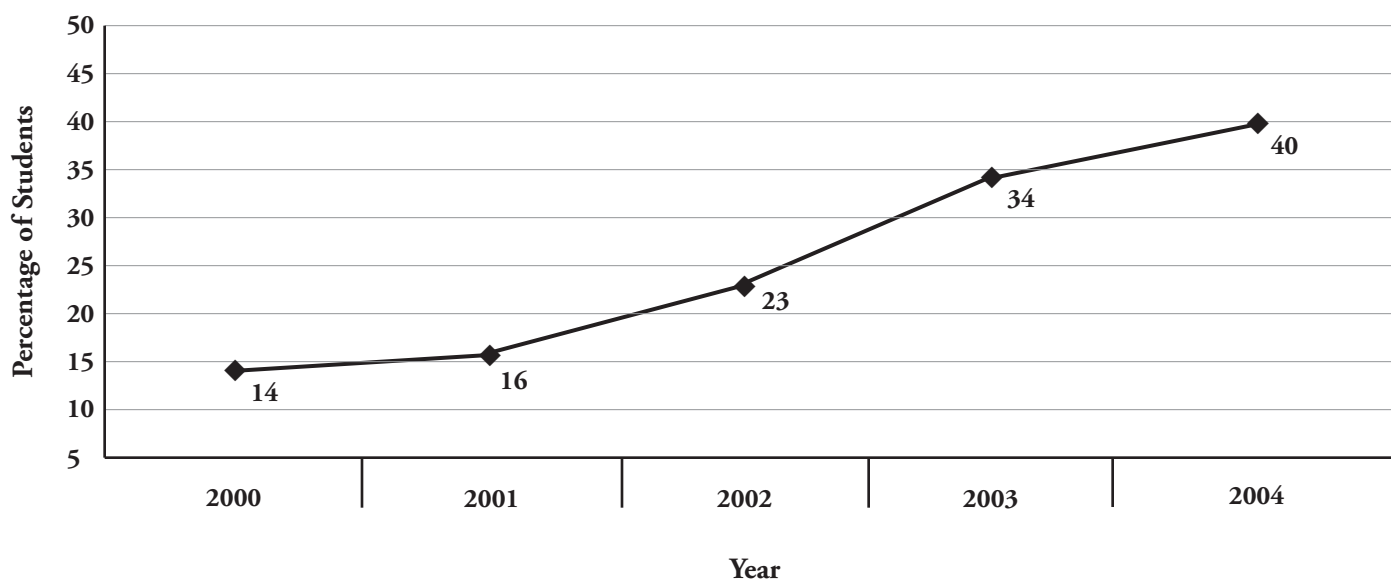
High school career/technical leaders can work with postsecondary and business leaders to set occupational standards that career/technical students need to meet and can develop assessments to measure whether the students are meeting the standards. After Kentucky reached agreement on essential industry standards for high school career/technical studies and developed tests to determine if students were acquiring the desired technical knowledge and skills, it has seen a steady rise in the numbers of students passing the program-based exams. Students that pass the exams receive skills standards certificates. Kentucky began offering the exams in 2000. (See Figure 2.) (Contact Rodney Kelly at rodney.kelly@education.ky.gov.)

Figure 1: Closing the Academic Achievement Gap Between Career/Technical Students and All Other Students in Kentucky



Source: Division of Career and Technical Education, Kentucky Department of Education
Based on: Commonwealth Accountability Testing System (CATS) Data

Figure 2: Increases in the Percentages of Career/Technical Students Earning Skills Standards Certificates in Kentucky



Source: Division of Career and Technical Education, Kentucky Department of Education
Based on: Commonwealth Accountability Testing System (CATS) Data

One way to raise academic and career/technical achievement is to organize a high school into several career-themed small learning communities or career academies. A team of academic and career/technical teachers in each academy actively engages a cohort of students in learning academic concepts connected to a career field. Students participate in a guidance and advisement program to plan for the future and receive extra help as needed to meet high expectations. (Contact Heather Sass, HSTW school improvement consultant, at heather.sass@sreb.org.) The National Academy Foundation has standards of practice to help schools implement academies or career-focused small learning communities. (Contact Gregg Betheil, National Academy Foundation, at gregg@naf-education.org.)

Another good way for schools to provide access to high-quality career/technical studies is to link with area postsecondary institutions to offer career-focused courses and to give students a jump on earning college credits before graduating from high school. This approach is particularly important for schools that lack the resources and/or facilities to offer a wide range of career/technical programs. **St. Louis Community College** in St. Louis, Missouri, and **Ivy Tech Community College of Indiana** in Columbus, Indiana, are two postsecondary institutions that have developed seamless career pathways from high school to college in four areas: science, technology engineering, mathematics and health science. (Contact Michelene Moeller, St. Louis Community College, at mmoeller@stlcc.edu or Jennifer Steinwedel, Ivy Tech Community College, at jsteinwe@ivytech.edu.)

Los Fresnos High School in rural Los Fresnos, Texas, uses strong partnerships with colleges and universities to offer a number of dual-enrollment and articulated classes. Dual-enrollment classes include U.S. history, economics and government, medical terminology, English IV and Microsoft Word and Excel. Students may also enroll jointly at the high school and at Texas State Technical College (TSTC) to study career/technical courses in health science technology, energy and environmental technology, plant maintenance, building trades, computer maintenance, electronics, aircraft mechanics, auto collision repair, auto technology, Principles of Technology, heating and air conditioning, machine shop, welding, advertising design and computer assisted design. The high school has

articulation agreements with TSTC, the University of Texas at Brownsville and Texas Southmost College, all local postsecondary institutions. The Ready, Set, Teach! program for students that want to enter the teaching field is articulated with all University of Texas schools. Other articulated classes are hospitality services, food science and nutrition, food science technology, and child development.

“When students take advantage of these many opportunities, they are able to graduate from high school with college credit at no cost to their families,” said **Sue Ellen Hill** of the career/technology department. “Many can have the first year of college almost completed.” (Contact Sue Ellen Hill at shill@lfcisd.net.)

A New Design for Career/Technical Studies

Many high schools seeking to strengthen their career/technical programs have adopted a national pre-engineering curriculum known as Project Lead The Way. Students in PLTW prepare for postsecondary engineering studies by taking a combination of college-preparatory-level mathematics and science courses along with challenging pre-engineering courses.

The PLTW curriculum is designed to help students understand engineering problem solving, understand how technological systems work with other systems, use mathematics knowledge and skills, communicate effectively and work with others.

High Schools That Work encourages schools to offer PLTW to give students another option for quality career/technical studies leading to college and a rewarding career. *HSTW* compared high school students enrolled in PLTW with students from similar career/technical fields of study and from career/technical studies in general. The study showed that PLTW students:

- had significantly higher achievement on a National Assessment of Educational Progress (NAEP)-based mathematics test than students from comparable career/technical fields;
- scored significantly higher in reading, mathematics and science than students from all career/technical fields;
- completed significantly more higher-level mathematics and science courses than students in similar fields or in all career/technical fields;
- were taking classes that engaged them in completing challenging assignments;
- experienced higher-quality career/technical classes requiring students to use academic knowledge and skills to complete assignments.

As a result of PLTW, schools have learned the value of investing in high-quality curriculum materials, defining sequences of mathematics and science courses, updating laboratories and supplies, providing staff development for teachers and counselors, developing alliances with colleges and universities, and using end-of-course exams.

(The *HSTW* study of students in Project Lead The Way is detailed in a research brief titled *Project Lead The Way: A Pre-engineering Curriculum That Works — A New Design for High School Career/Technical Studies*. By Gene Bottoms and Karen Anthony. (05V08); 16 pages; \$2; \$1 each for 10 or more. The study is the focus of a PowerPoint presentation titled "A New Design for High School Career/Technical Studies" by Gene Bottoms at the 2005 *HSTW* Staff Development Conference. (Download free from *HSTW* Publications and Materials on the SREB Web site at www.sreb.org.) A videotape (VHS) of the presentation also is available. (05V46v); \$30. For more information on ordering materials, visit www.sreb.org; call (404) 875-9211, Ext. 236; or e-mail publications@sreb.org.)